TITLE: CELLULOLYTIC ENZYMES DETECTION BY SUBMERGED FERMENTATION USING FILAMENTOUS FUNGI ISOLATED FROM BRAZILIAN TROPICAL FOREST SOIL

AUTHORS: BARUQUE, J. R. B; NASCIMENTO, R. P.

INSTITUTION: UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, CENTRO DE TECNOLOGIA, ESCOLA DE QUÍMICA, DEPARTAMENTO DE ENGENHARIA BIOQUÍMICA LABORATÓRIO DE ECOLOGIA E PROCESSOS MICROBIANOS, RIO DE JANEIRO, RJ (AVENIDA ATHOS DA SILVEIRA RAMOS, 149, BLOCO E, 1º ANDAR, E-108, CEP 21941-909, RIO DE JANEIRO – RJ, BRAZIL)

ABSTRACT:

Filamentous fungi are aerobic and chemoorganotrophic microorganisms widely distributed in nature, present in soils under different vegetations, such as Atlantic Forest, Cerrado, Caatinga and Amazonian Forest. Due to its metabolic versatility, fungi are capable of producing different enzymes, as cellulases, with potential for biotechnological purposes, and can be applied in the textile, food and bioenergy industries. Cellulases are enzymes produced by several microbial groups capable of hydrolyzing the cellulose fiber to glucose and being classified into 3 groups: endoglucanases, cellobiohydrolases and β-glucosidases. Filamentous fungi are known as the major cellulase producing microorganisms. In this way, the present study aimed isolate different filamentous fungi strains with cellulolytic capacity from soil samples of Atlantic Forest collected in National Park of Itatiaia – RJ. Twenty-six (26) fungi were isolated in mineral medium supplemented with microcrystalline cellulose 1.0% (w/v) as main carbon source. The systems were incubated at 28°C for 10 days and after that period the fungal strains were purified and transferred to Malt Agar Medium (pH 5.0). After grown, the fungi strains were preserved in sterile water. Fungi strains, after grown in Malt Agar Medium for 10 days, were inoculated in conical flasks containing mineral medium containing filter paper 1.0% (w/v) as main carbon source and supplemented with yeast extract and incubated at 28°C / 200 rpm / 7 days. Each 3, 5 and 7 days, aliquots were collected, centrifuged and the activity of CMCase (endoglucanases) and FPase (exoglucanases) were determined by the quantification of reducing sugars (DNS). The highest activity value of CMCase (1.636.66 U / l) was detected by strain I14-13 after 7 days of fermentation, while the highest FPase activity (330.85 U / l) was detected by strain I14-12 after 5 days Fermentation. This study suggests the biotechnological potential of filamentous fungi of tropical forest in degradation of vegetal biomass to produce biocompounds.

Keywords: cellulases, fermentation, filamentous fungi

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